

KRAMER
VIC. J. Clark Salyer National Wildlife Refuge, Dam 326
Along the Lower Souris River
Bottineau County
McHenry County
North Dakota

HAER No. ND-4-B

HAER
ND,
5-KRAM,
1-B-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
Rocky Mountain Regional Office
National Park Service
U.S. Department of the Interior
12795 W. Alameda Parkway
Denver, Colorado 80225

HISTORIC AMERICAN ENGINEERING RECORD

HAER
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J. Clark Salyer National Wildlife Refuge, Dam 326

HAER No. ND-4-B

Location: Along the Lower Souris River, in the J. Clark Salyer National Wildlife Refuge,
Bottineau and McHenry Counties, North Dakota

KRAMER VIC.

UTM: NE End: 48 degrees, 38' 17" (lat.); 100 degrees, 38' 07" (long.)

SW End: 48 degrees, 37' 09" (lat.); 100 degrees, 43' 39" (long.)

Quad: Upham and Fordham

Date of Construction: 1935-1936

Present Owner: U.S. Fish and Wildlife Service

Present Use: Damming Souris River

Significance: The dams within the J. Clark Salyer National Wildlife Refuge represent a historical movement to preserve wildlife and wildlife habitat in the United States, which began in the mid-19th century and continues today. The refuge dams are significant for their association with the development of the national wildlife refuge system during the New Deal Era. At the time of its creation, the J. Clark Salyer Wildlife Refuge was considered the most important project in the Federal Government's program of migratory waterfowl habitat restoration. The dams also are representative examples of dams designed by the Federal Government during the New Deal Era for conservation projects.

Historians: Frederick L. Quivik, RTI, Inc., August 1989
Mary E. McCormick, RTI, Inc., August 1989
Jane L. Carroll, St. Paul District Corps of Engineers, March 1990

For more historical information, see J. Clark Salyer National Wildlife Refuge Dams, HAER No. ND-4

J. CLARK SALYER NATIONAL WILDLIFE REFUGE DAMS (Lower Souris National Wildlife Refuge)

The J. Clark Salyer National Wildlife Refuge is located along a winding 75-mile stretch of the Souris River in Bottineau and McHenry counties in north-central North Dakota. Originally established in the mid-1930s as the Lower Souris National Wildlife Refuge, this refuge was renamed in 1967 in honor of J. Clark Salyer, II, the chief of the national wildlife refuge program from 1934-1961. The 58,700-acre refuge is largely comprised of native prairie lands, with some wooded bottom lands and aspen and brush-covered sandhills, as well as over 21,000 acres of restored river ponds, marshes, and wet meadows. Water developments in the refuge were established and are maintained by a network of five major dams and other diversion structures, including two small masonry dams and several dikes, levees and channels. The five major dams are located so that their reservoirs or backwaters extend nearly the entire length of the refuge, from near Upham north to the United States-Canada border. The headquarters for the refuge are situated west of the river, about two miles north-northeast of the town of Upham, and adjacent to one of the southernmost dams, Dam 326. Access to the refuge headquarters from Upham is provided by a county highway.

DAM 326

Dam 326 is situated about 2-1/3 miles northwest, or (Sec. 3, T159N, R78W) and Bottineau County (SE 1/4 Sec. 34 and SW 1/4 Sec. 35, T160N, R78W). The refuge headquarters is situated less than 1/4 mile southeast of the dams west end.

Dam 326 is oriented along a northeast/southeast axis and consists of a homogeneous earthfill embankment, an emergency spillway, and outlet works. The earthfill embankment has a crest width between 12 and 18 feet and, including the spillway, is 9,435 feet long. Original plans for the dam reportedly called for the top soils at the site to be plowed before construction of the embankment. Earthfill for the embankment was apparently excavated from a nearby location. [1] In the late 1940s, flood water topped the embankment and, in 1950, three additional feet of soil was laid along the crest. [2] The current height of the embankment is 13 feet and its crest elevation is 1427.4 feet. The upstream slope of the embankment varies between 4:1 at the base, 12:1 at the middle section, and 5:1 at the upper section. The downstream slope of the embankment is 4:1. The embankment is vegetated with grass, except at the west end of the downstream slope, which is rock riprap for about 600 to 700 feet.

The emergency spillway is an uncontrolled weir located along the crest of the embankment about 4,650 feet northeast of the left abutment of the dam. The spillway was originally constructed as a 700-foot-long stone masonry wall with flared stone-masonry wing walls and a stone masonry apron below the wall's downstream edge. Since then, most likely in the late 1940s, the stone masonry wall was modified to its current configuration by the addition of a concrete cap and concrete buttresses that are spaced about 12 feet on center along its downstream face. [3] Only the tops of the concrete cap and buttresses are currently visible. The crest elevation of the weir is 1,421.1 feet.

The outlet works span the natural river channel and are located about 3,600 feet southwest of the northeast abutment of the dam. The outlet works consist of a reinforced concrete structure with three radial gates. The concrete structure is comprised of four, 15-foot-long by 10-foot-high walls (two end walls and two piers), which serve as supports to the radial gates. The downstream wing walls of the concrete structure are constructed of interlocking, corrugated sheet piling, and the upstream wing walls are concrete.

The radial gates each consist of a corrugated steel face (16 feet wide by 7 feet high) with channel-section supports and angle-section radials. The outer face of each gate is set along the upstream side of the concrete structure. There is no intake to the gates; however, the concrete walls between the gates extend downstream and serve as outlet structures. The outlets discharge into a stilling basin that consists of a plunge pool with a concrete apron.

Manual hoists operate the radial gates. The hoist control for each gate is mounted on top of an adjacent concrete wall. A cantilevered walkway along the structure's upstream side provides access the hoists. The walkway is secured to the structure by angle-section knee-braces and consists of a plank deck with angle-section railing. Along its downstream side, the concrete structure also supports a concrete beam walkway that is protected by an angle-section rail. In 1950, the original height of the concrete structure was raised 3 feet by concrete caps that were added to the top of each of the end walls and piers, as well as both of the upstream wing walls. At this same time, the gate hoist controls, and the upstream and downstream walkways were removed and reinstalled in their current locations. [4]

FOOTNOTES

- 1 Marshall Fox and Terry Clayton, "Inspection report, J. Clark Salyer Dam #326, J. Clark Salyer National Wildlife Refuge, McHenry County, North Dakota, Federal Inventory Number ND 00328, p. 10, report prepared for the U.S. Fish and Wildlife Service, June 1984.
- 2 Ibid., p. 14.
- 3 John F. Reiger, American Sportsmen and the Origins of Conservation, Norman: University of Oklahoma Press, 1975, p. 21.
- 4 Details of alterations to three outlet works are provided by drawing M-No. DAK. 3-321, "Lower Souris: raising Radial Gate Control Structures on Dams 326, 332, 341, and 357," September 1949, revised July 1950, included as attachment C-12 to Marshall and Clayton, "Inspection Report, Dam 357."